

LISTING OF CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A coated object, comprising:
a substrate having at least one functional layer,
~~characterized by, that; and~~
at least one interlayer ~~is being~~ arranged in said at least one said functional layer, ~~the~~ said at least one interlayer ~~has~~ having a layer thickness of $[[d_z \leq]]$ less than or equal to 10 nm, ~~and the said interlayer~~ interrupts interrupting the morphology of ~~the~~ said at least one functional layer, ~~and divides the~~ dividing said at least one functional layer in a plurality of partial layers $[[T_s]]$.

2. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the~~ wherein said at least one interlayer interrupts the morphology of ~~the~~ said at least one functional layer at least once, ~~in such a manner~~ so that said plurality of partial layers $[[T_s]]$ are formed and ~~the~~ a layer thickness of ~~the~~ said plurality of partial layers $[[T_s]]$ remains below a predetermined layer thickness at which a phase transformation of ~~the~~ said at least one functional layer no longer occurs.

3. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the wherein said at least one~~ functional layer is a predominantly crystalline layer, and ~~the~~ the said at least one interlayer interrupts the morphology of the said at least one functional layer at least once, ~~in such a~~ manner so that said plurality of partial layers $[[T_s]]$ are formed and ~~the~~ the said at least one functional layer has dense columns ~~which~~ that are laterally tightly cohesive, grow perpendicular to ~~the substrate~~ a surface of said substrate and have substantially no tendency to widen out.

4. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a wherein said at least one~~ functional layer ~~contains one~~ comprises an element selected from the group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides.

5. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a wherein said at least one~~ functional layer ~~contains~~ comprises a plurality of elements selected from the group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides.

6. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a wherein said at least one~~ functional layer ~~contains one~~ comprises an element selected from the group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

7. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said at least one functional layer ~~contains~~ comprises a plurality of elements selected from the group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

8. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said at least one functional layer ~~contains~~ comprises a plurality of mixed systems each having ~~comprising~~ one element selected from a first group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides, ~~which is~~ compound said first group being compounded with at least one element selected from a second group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

9. (Currently amended) The coated object as claimed in claim 8, ~~characterized by, that the~~ wherein said plurality of mixed systems comprising ~~have~~ one element selected from the group consisting of metal oxides, metal nitrides, and metal carbides.

10. (Currently amended) The coated object as claimed in claim 9, ~~characterized by, that the~~ wherein said plurality of mixed systems having ~~comprise~~ at least two metallic components.

11. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said at least one functional layer ~~contains~~ comprises a plurality of mixed systems ~~comprising~~ having a plurality of elements selected from a first group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides, which ~~are compound~~ said first group being compounded with at least one element selected from a secound group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

12. (Currently amended) The coated object as claimed in claim 11, ~~characterized by, that the~~ wherein said plurality of mixed systems ~~comprising~~ comprise one element selected from the group consisting of metal oxynitrides, metal carbonitrides, and metal oxycarbonitrides.

13. (Currently amended) The coated object as claimed in claim 12, ~~characterized by, that the~~ wherein said plurality of mixed systems having comprise at least two metallic components.

14. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that~~ further comprising a plurality of different functional layers ~~are applied to the~~ said substrate.

15. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the~~ wherein said at least one interlayer has a different chemical composition than ~~the~~ said at least one functional layer ~~which is to be interrupted~~.

16. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said at least one interlayer ~~contains~~ comprises one element selected from the group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides.

17. (Currently amended) The coated object as claimed in claim 1, wherein said at least one interlayer ~~contains~~ comprises a plurality of elements selected from the group ~~containing~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides.

18. (Currently amended) The coated object as claimed in claim 1, wherein said at least one interlayer ~~contains~~ comprises one element selected from the group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

19. (Currently amended) The coated object as claimed in claim 1, wherein said at least one interlayer ~~contains~~ comprises a plurality of elements selected from the group ~~containing~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

20. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said interlayer ~~contains~~ comprises a plurality of mixed systems ~~comprising~~ having one element selected from a first group ~~comprising~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides, ~~which is compound said~~ first group being compounded with at least one element selected from a secound group ~~comprising~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

21. (Currently amended) The coated object as claimed in claim 20, ~~characterized by, that the~~ wherein said plurality of mixed systems ~~comprising~~ comprise one element selected from the group consisting of metal oxides, metal nitrides, and metal carbides.

22. (Currently amended) The coated object as claimed in claim 21, ~~characterized by, that the~~ wherein said plurality of mixed systems having comprise at least two metallic components.

23. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that a~~ wherein said at least one interlayer ~~contains~~ comprises a plurality of mixed systems, said plurality of mixed systems ~~comprising~~ having a plurality of elements selected from a first group ~~comprising~~ consisting of oxides, nitrides, carbides, fluorides, chlorides, selenides, tellurides, and sulfides, ~~which are compound said~~ first group being with at least one element selected from a second group ~~comprising~~ consisting of Li, Be, Na, Mg, Al, Si, Ca, Sc, Ti, Cr, Zn, Ge, Sr, Y, Zr, Nb, Cd, In, Sn, Sb, Te, La, Ce, Pr, Nd, Sm, Gd, Yb, Lu, Hf, Ta, Tl, Pb, Bi, and Th.

24. (Currently amended) The coated object as claimed in claim 23, ~~characterized by, that the wherein said plurality of mixed systems comprising comprise~~ one element selected from the group consisting of metal oxynitrides, metal carbonitrides, and metal oxycarbonitrides.

25. (Currently amended) The coated object as claimed in claim 24, ~~characterized by, that the wherein said plurality of mixed systems having comprise~~ at least two metallic components.

26. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the wherein said at least one functional layer is an optical functional layer and the said at least one interlayer interrupts the morphology of the optical functional layer and divides the optical functional layer in~~ said plurality of partial layers [[T_s]].

27. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the layer thickness of wherein said optical function layer [[is]] has a layer thickness~~ in the range from 10 to 1000 nm.

28. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the layer thickness of wherein said optical function layer [[is]] has a layer thickness~~ in the range from 30 to 500 nm.

29. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the layer thickness of wherein said plurality of partial layers [[T_s is]] have a layer thickness~~ in the range from 10 to 70 nm.

30. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the layer thickness of wherein said plurality of~~ partial layers $[[T_s \text{ is}]]$ ~~have a layer thickness~~ in the range from 20 to 45 nm.

31. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the wherein said~~ layer thickness $[[d_z]]$ of the said at least one interlayer is in the range from 0.3 to 10 nm.

32. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the wherein said~~ layer thickness $[[d_z]]$ of the said at least one interlayer is in the range from 1 to 3 nm.

33. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the wherein said~~ layer thickness $[[d_z]]$ of the said at least one interlayer is in the range from 1.5 to 2.5 nm.

34. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the said coated object wherein said at least one functional layer comprises a plurality of functional layers defining an alternating optical layer system, said alternating optical layer system having made up of a plurality of said functional layers, which are optical functions layer with a high refractive index layer and optical functional layers with a low refractive index layer.~~

35. (Currently amended) The coated object as claimed in claim 34, ~~characterized by, that optical functional layers with wherein said~~ high refractive index layer are is interrupted by a plurality of interlayers with a low refractive index.

36. (Currently amended) The coated object as claimed in claim 34, ~~characterized by, that optical functional layers with a wherein said~~ low refractive index layer are is interrupted by a plurality of interlayers with a high refractive index.

37. (Currently amended) The coated object as claimed in claim 34, ~~characterized by, that the optical functional layer with a wherein said~~ high refractive index layer contains comprises one element selected from the group containing consisting of titanium oxide, titanium aluminum oxide, and zirconium oxide.

38. (Currently amended) The coated object as claimed in claim 36, ~~characterized by, that the interlayer with a wherein said~~ high refractive index layer contains comprises one element selected from the group containing consisting of titanium oxide, titanium aluminum oxide, and zirconium oxide.

39. (Currently amended) The coated object as claimed in claim 34, ~~characterized by, that the optical functional layer with a wherein said~~ low refractive index layer comprises silicon oxide.

40. (Currently amended) The coated object as claimed in claim 35, wherein said plurality of interlayers with a low refractive index comprises silicon oxide.

41. (Currently amended) The coated object as claimed in claim 26, ~~characterized by, that the~~ wherein said substrate ~~contain~~ comprises one element selected from the group ~~containing~~ consisting of metal, glass, glass-ceramic, composite, and plastic.

42. (Currently amended) The coated object as claimed in claim 26, ~~characterized by its use~~ wherein the coated object is useable as an optical element, ~~which can be~~ one element selected from the group ~~containing~~ consisting of a reflector for digital projection, a lens for digital projection, a mirror for digital projection, an illumination means for digital projection, a reflector for stage, a lens for stage, an illumination means for stage, a reflector for architectural lighting, a lens for architectural lighting, an illumination means for architectural lighting, a prism for the UV wavelength region, a lens for the UV wavelength region, a mirror for the UV wavelength region, a reflector for the UV wavelength region, a filter for the UV wavelength region, an illumination means for the UV wavelength region, a prism for the IR wavelength region, a lens for the IR wavelength region, a mirror for the IR wavelength region, a reflector for the IR wavelength region, a filter for the IR wavelength region, an illumination means for the IR wavelength region, a display for monitors, and a display units.

43. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the~~ wherein said at least one functional layer is made from a metal, and ~~the~~ wherein said at least one interlayer, ~~which interrupted the morphology of this functional layer~~ is made from a metal oxide.

44. (Currently amended) The coated object as claimed in claim 43, ~~characterized by, that the~~ wherein said at least one functional layer comprises chromium, and ~~the~~ wherein said at least one interlayer comprises chromium oxide.

45. (Currently amended) The coated object as claimed in 43, ~~characterized by its use~~ wherein the coating object is useable as a carrier element for lithographic processes.

46. (Currently amended) The coated object as claimed in claim 1, ~~characterized by, that the~~ wherein said at least one functional layer is ~~an~~ a protective layer, and ~~the~~ wherein said at least one interlayer interrupts the morphology of ~~the~~ said protective layer and divides ~~the~~ said protective layer in said plurality of partial layers $[[T_s]]$.

47. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ layer thickness of wherein said protective layer ~~is~~ has a layer thickness in the range from 100 to 20,000 nm.

48. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ layer thickness of wherein said protective layer ~~is~~ has a layer thickness in the range from 500 to 10,000 nm.

49. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ layer thickness of wherein said protective layer ~~is~~ has a layer thickness in the range from 1500 to 5000 nm.

50. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the layer thickness of wherein said plurality of~~ partial layers $[T_s \text{ is}]$ have a layer thickness in the range from 30 to 500 nm.

51. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the layer thickness of wherein said plurality of~~ partial layers $[T_s \text{ is}]$ have a layer thickness in the range from 100 to 250 nm.

52. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the layer thickness d_s of the wherein said at least one interlayer is has a layer thickness~~ in the range from 0.3 to 10 nm.

53. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the layer thickness d_s of the wherein said at least one interlayer is has a layer thickness~~ in the range from 1 to 5 nm.

54. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the wherein said protective layer interrupted by interlayers has a morphology with a plurality of~~ columns which, on average, have a lateral extent of less than 1 μm .

55. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the wherein said protective layer interrupted by interlayers has a morphology with a plurality of~~ columns which, on average, have a lateral extent of less than 200 nm.

56. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ wherein said protective layer comprises silicon nitride.

57. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ wherein said protective layer comprises zirconium oxide in a thermally stable crystal phase.

58. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ wherein said at least one interlayer ~~contain~~ comprises one element selected from the group ~~containing~~ consisting of zirconium nitride, silicon oxide, and titanium aluminum oxide.

59. (Currently amended) The coated object as claimed in claim 46, ~~characterized by, that the~~ wherein said substrate ~~contains~~ comprises one element selected from the group ~~containing~~ consisting of glass, glass-ceramic, and nonmetallic crystalline materials.

60. (Currently amended) The coated object as claimed in claim 46, ~~characterized by its use~~ wherein the coated object is useable as a cooking plate for a cooking hob.

61. (Currently amended) A coated object, comprising:
a substrate having at least one functional layer,
~~characterized by, that; and~~

at least one interlayer, which is different than ~~the said~~
at least one functional layer, ~~is being~~ arranged in said at
least one functional layer, ~~the said at least one~~ interlayer
having the same refractive index as ~~the said at least one~~
functional layer and ~~the said at least one~~ interlayer forming a
layer ~~which that~~ interrupts the morphology of ~~the said at least~~
one functional layer.

62. (Currently amended) The coated object as claimed in
claim 61, ~~characterized by, that the wherein said at least one~~
functional layer comprises a metal oxide, ~~and the wherein said~~
at least one interlayer comprises a metal oxide having at least
two metallic components, ~~and wherein and the refractive index of~~
~~the said at least one~~ interlayer has a refractive index that can
be varied by adjusting ~~the a~~ quantitative ratio of ~~the said at~~
least two metallic components.

63. (Currently amended) The coated object as claimed in
claim 61, ~~characterized by, that the wherein said at least one~~
functional layer comprises zirconium oxide, ~~and the wherein said~~
at least one interlayer comprises titanium aluminum oxide, ~~and~~
~~wherein and the refractive index of the said at least one~~
interlayer has a refractive index that can be varied by
adjusting ~~the a~~ quantitative ratio of titanium and aluminum in
said titanium aluminum oxide.

64. (Currently amended) The coated object as claimed in claim 61, ~~characterized by, that the wherein said at least one~~ interlayer comprises a metal oxide, ~~and the wherein said at least one~~ functional layer comprises a metal oxide having at least two metallic components, ~~and wherein and the refractive index of the said at least one~~ functional layer ~~has a refractive index that~~ can be varied by adjusting ~~the a~~ quantitative ratio of ~~the said at least two~~ metallic components.

65. (Currently amended) The coated object as claimed in claim 61, ~~characterized by, that the wherein said at least one~~ interlayer comprises zirconium oxide, ~~and the wherein said at least one~~ functional layer comprises titanium aluminum oxide, ~~and wherein and the refractive index of the said at least one~~ functional layer ~~has a refractive index that~~ can be varied by adjusting ~~the a~~ quantitative ratio of titanium and aluminum in said titanium aluminum oxide.

66. (Currently amended) A coated object, comprising:
a substrate having at least one optical functional layer
~~with, said at least one optical functional layer having a layer~~
thickness between 20 and 1,000 nm, ~~and which is having~~ a
predominantly amorphous layer, ~~characterized by, that in at~~
~~least one said functional layer is arranged and having at least~~
~~one interlayer arranged therein, said at least one interlayer~~
~~which is different than the functional layer, which has having~~ a
different morphology than the said at least one optical
functional layer, ~~which has having~~ a layer thickness $[[d_z \leq]]$
less than or equal to 10 nm, and which divides the dividing said
at least one optical functional layer in a plurality of partial
layers $[[T_s,]]$ so that the layer thickness of the said plurality
of partial layers $[[T_s \text{ is}]]$ have a layer thickness between 10 and
50 nm.

67. (Currently amended) A coated object, comprising:
a substrate having at least one optical functional layer
~~with, said at least one optical functional layer having a layer~~
thickness between 20 and 1,000 nm, ~~and which is having~~ a
predominantly crystalline layer in a thermally unstable crystal
phase, ~~characterized by, that in at least one said functional~~
~~layer is arranged and having at least one interlayer arranged~~
~~therein which is different than the functional layer, which has,~~
~~said at least one interlayer having a different morphology than~~
~~the said at least one optical functional layer, which has having~~
a layer thickness $[[d_z \leq]]$ less than or equal to 10 nm, and which
divides the dividing said at least one optical functional layer
in a plurality of partial layers $[[T_s,]]$ so that the layer
thickness of the said plurality of partial layers $[[T_s]]$ is have
a layer thickness between 10 and 50 nm.

68. (Currently amended) A coated object, comprising:
a substrate having at least one protective functional layer, said at least one protective functional layer having with a layer thickness between 100 and 20,000 nm, and which is having a predominantly crystalline layer in a thermally stable crystal phase, characterized by, that in at least one said functional layer is arranged and having at least one interlayer arranged therein, which is different than the functional layer, which has said at least one interlayer having a different morphology than the said at least one protective functional layer, which has having a layer thickness [[d₂ ≤]] less than or equal to 10 nm, and which divides the dividing said at least one protective functional layer in a plurality of partial layers [[T_s,]] so that the layer thickness of the said plurality of partial layers [[T_s is]] have a layer thickness between 30 and 500 nm.

69. (Currently amended) The coated object as claimed in claim 1, characterized by its use as a A diffusion-inhibiting container, comprising:

a substrate;
a functional layer disposed on said substrate; and
an interlayer arranged in said functional layer, wherein
said interlayer has a layer thickness of less than or equal to
10 nm, interrupts the morphology of said functional layer, and
divides said functional layer in a plurality of partial layers.

70. (Currently amended) A process for producing ~~the a~~ coated object as claimed in claim 1, characterized by, that the ~~coating is applied, comprising:~~

using a CVD or PVD process to apply a coating to a substrate, said coating having at least one functional layer and at least one interlayer arranged in said at least one said functional layer, said at least one interlayer having a layer thickness of less than or equal to 10 nm, interrupting the morphology of said at least one functional layer, and dividing said at least one functional layer in a plurality of partial layers.

71. (Currently amended) The process for producing a coated object as claimed in claim [[2]] 70, characterized by, that the ~~coating is applied using wherein said CVD or PVD process is a reactive CVD process, preferably selected from the following group[[:]] group consisting of [[- PICVD ()] plasma impulse chemical vapor deposition [()]], [[- PECVD ()] plasma-enhanced chemical vapor deposition [()]], [[- PACVD ()] plasma-assisted chemical vapor deposition [()]], and [[- TCVD ()] thermal chemical vapor deposition[()]].~~

72. (Currently amended) The process for producing a coated object as claimed in claim 71, ~~characterized by, that the wherein said coating is applied discontinuously in the form of pulse cycles[[,] so that the thickness of a respective functional layer and interlayer being is set by means of the number of cycles.~~

73. (Currently amended) The process for producing a coated object as claimed in claim 71, ~~characterized by, that in each case the wherein said at least one functional layer and said at least one interlayer are applied such so that a lowest layer thickness, which is applied in precisely one pulse cycle, can be set to is~~ 0.1 to 0.3 nm.

74. (Currently amended) The process for producing a coated object as claimed in claim [[3]] 70, ~~characterized by, that the coating is applied using wherein said CVD or PVD process is a reactive PVD process, preferably using magnetron sputtering.~~

75. (Currently amended) The process for producing a coated object as claimed in claim [[3]] 70, ~~characterized by, that the coating is applied using wherein said CVD or PVD process is a reactive ion beam-assisted PVD process, preferably using ion beam assisted ion beam sputtering or ion beam assisted electron beam evaporation coating.~~